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# **Epidemiology of AYA Cancers in Texas**

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# AYA Overview

- Background
- AYA Incidence
- AYA Mortality
- Survival
- Next Steps
- Conclusion

# Background

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## Texas Cancer Registry: Who We Are

- The Texas Cancer Registry (TCR) is a combination active/passive population-based surveillance system that collects, manages, analyzes, and disseminates Texas cancer incidence data
- Serves as the foundation for measuring the Texas cancer burden, comprehensive cancer control efforts, health disparities, progress in prevention, diagnosis, treatment, and survivorship, as well as supports a wide variety of cancer-related research.



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# Background

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## Texas Cancer Registry: Who We Are

- One of the largest of 49 US state and territorial cancer registries that report cancer incidence data to and are funded by the Centers for Disease Control and Prevention (CDC), National Program of Cancer Registries (NPCR)
- Nationally recognized as a Gold Certified and high quality data registry by the North American Association of Central Cancer Registries and CDC
- One of only 10 Specialized Comparative Effectiveness Registries designated by the CDC



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# Background

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## Texas Cancer Registry: Who We Are

**Vision:** A cancer-free Texas.

**Mission:** To collect, maintain, and disseminate high quality cancer data that contribute towards cancer prevention and control, research, improving diagnoses, treatment, survival, and quality of life for all cancer patients



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# Background

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## Texas Cancer Registry: Who We Are

### Philosophy:

Maintain a high quality nationally certified statewide population-based cancer registry with complete, timely, and accurate data

Meet the data needs of Texans, including public health officials, healthcare practitioners, cancer researchers, health planners, advocacy groups, the public, and other local, state, and national entities

Make a significant contribution to the fight against cancer



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# Background

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## Adolescent and Young Adult (AYA) Cancers

- Because of their relatively low cancer incidence, the adolescent and young adult population has not been a major focus of cancer control and prevention in the U.S. or Texas
- AYAs are particularly at risk of being “lost” in health care, public health, surveillance, and research systems



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All Sites, includes Invasive Cancer and CNS (all behaviors).

Rates are per 100,000 and age-adjusted to the 2000 US Std Population (19 age groups - Census P25-1130) standard.

Source: Incidence - Texas, 1995-2014, cut-off 11-14-2016, SEER\*Prep 2.5.3 [19 Age Groups], Texas Cancer Registry, March 2017.

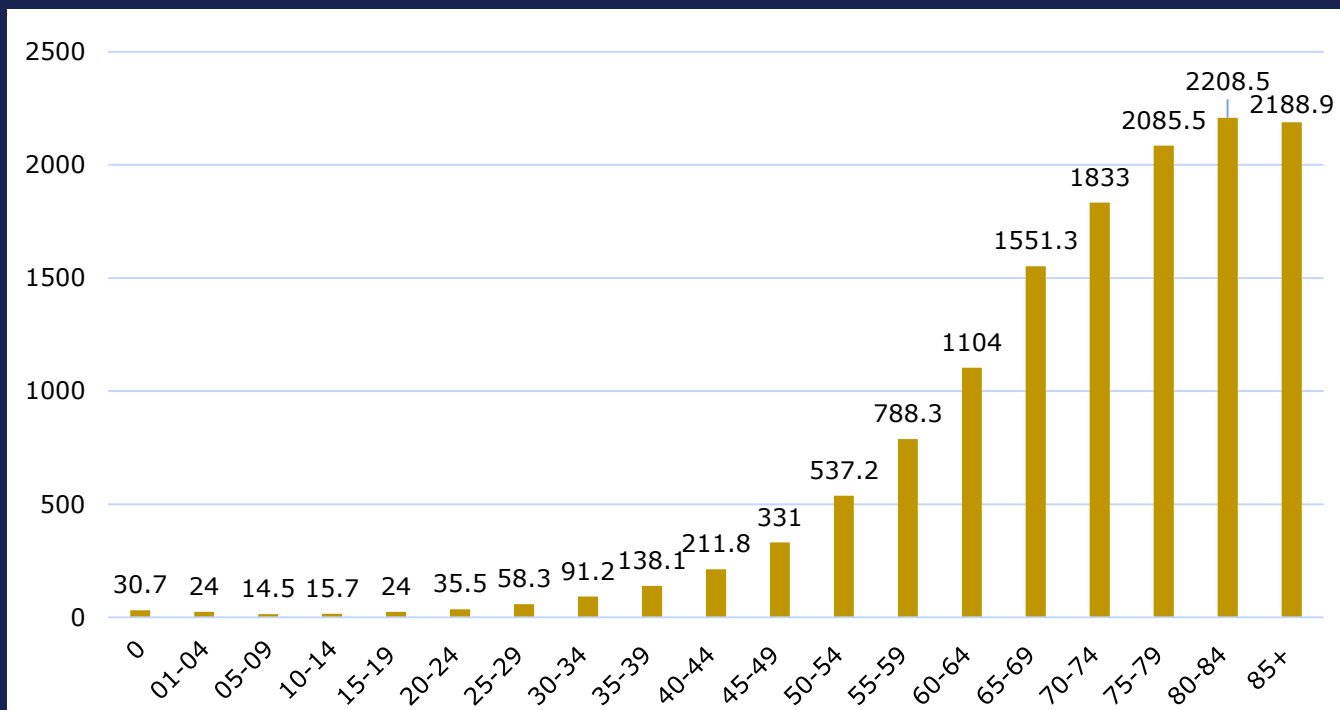
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# Incidence

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## Age-Adjusted Cancer Incidence in Texas, All Sites, 2010-2014

- Cancer occurring between the ages of 15-39 is much less common than cancer in older age groups



Rates are per 100,000 and age-adjusted to the 2000 US Std Population (a9 age groups - Census P25-1130) standard.

Source: Incidence - Texas, 1995-2014, cut-off 11-14-2016, SEER\*Prep 2.5.3 [19 Age Groups], Texas Cancer Registry, Texas Department of State Health Services, March 2017.



# Background

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## Adolescent and Young Adult (AYA) Cancers

- As an age group, this population is experiencing distinct physical changes, challenges, and emotional hurdles
- Cancer often poses a unique burden to their growth and development



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# Background

- Texas is a particularly challenging state for health care
  - Both geographically and ethnically diverse
  - 254 counties
  - Rural population
  - Medically underserved areas
  - Highest uninsured rate in the nation





# Incidence

- About **70,000** young people (ages 15-39) are diagnosed with cancer each year in the **U.S.**
- Accounts for about **5 percent** of cancer diagnosed in the **U.S.**
- This is about **6 times** the number of cancers diagnosed in children ages 0-14





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# Incidence

- About **6,400** young people (ages 15-39) are diagnosed with cancer each year in **Texas**
- Accounts for **6 percent** of cancer diagnosed in the **Texas**
- Is just over **6 times** the number of cancers diagnosed in children ages 0-14



# Incidence

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## Adolescent and Young Adult (AYA) Cancers

- Cancers in AYAs are unique in the distributions that occur.
- Hodgkin lymphoma, melanoma, testis cancer, female genital tract malignancies, thyroid cancer, soft tissue sarcomas, non-Hodgkin lymphoma, leukemia, brain and spinal cord tumors, breast cancer, bone sarcomas, and non-gonadal germ cell tumors account for **95%** of the cancers in this age group for the U.S.
- For Texas, these cancers make up **94%** of cancers in this age group

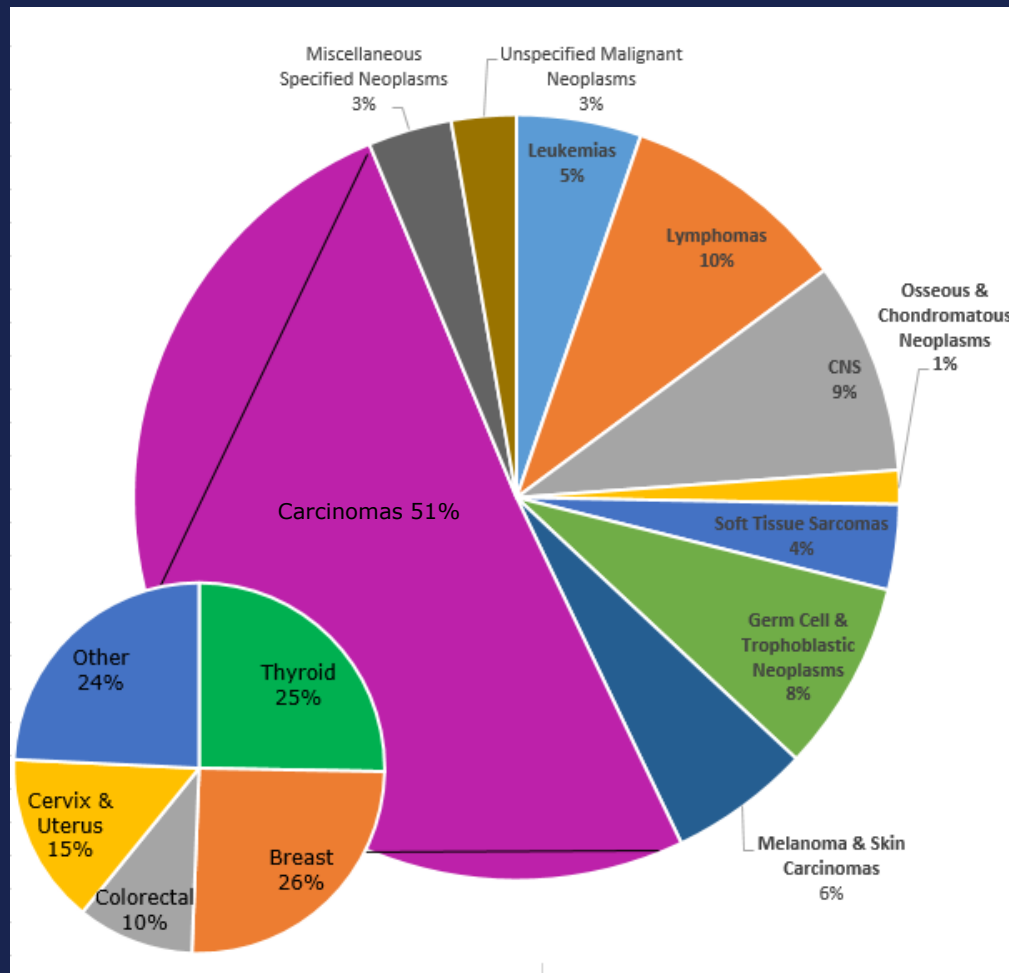


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# Incidence

## AYA Cancers by Adapted Tumor Classification, Texas 2010-2014



Source: Incidence - Texas, 1995-2014, cut-off 11-14-2016, SEER\*Prep 2.5.3 [19 Age Groups], Texas Cancer Registry, Texas Department of State Health Services, March 2017.



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# Incidence

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## Adolescent and Young Adult (AYA) Cancers

- The most common AYA cancer sites vary by age group
- The frequency distribution of cancer types changes dramatically from age 15-39, such that the pattern at the youngest age does not resemble the one at the oldest.



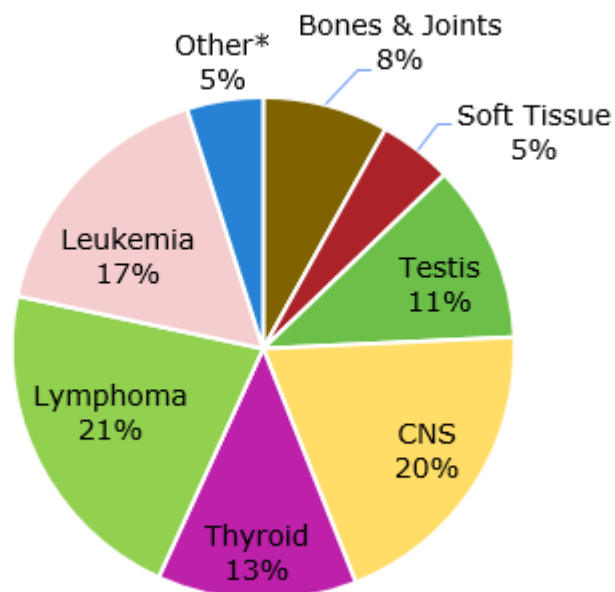
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# Incidence

## Common Cancer Sites (ages 15-19) by Primary Site, Texas 2010-2014



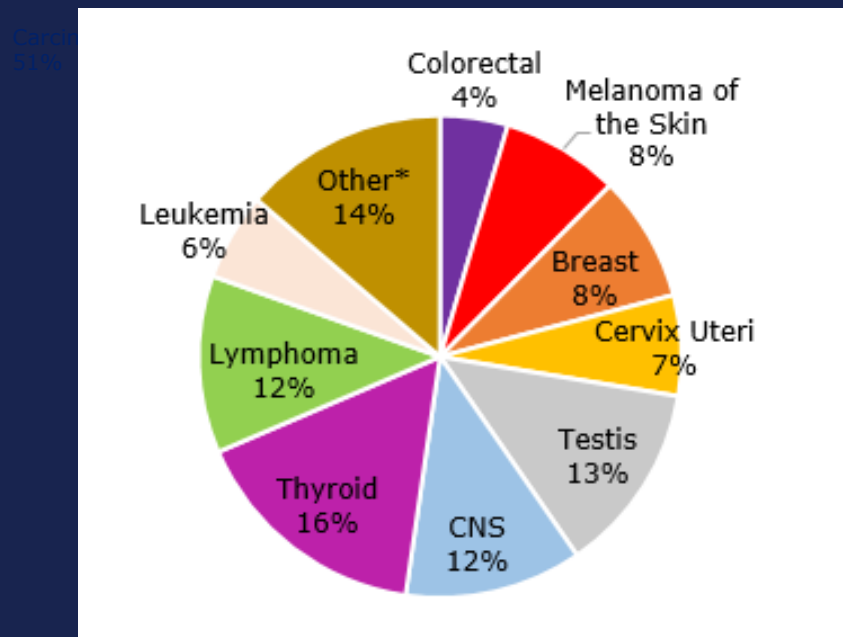
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# Incidence

## Common Cancer Sites (ages 25-29) by Primary Site, Texas 2010-2014

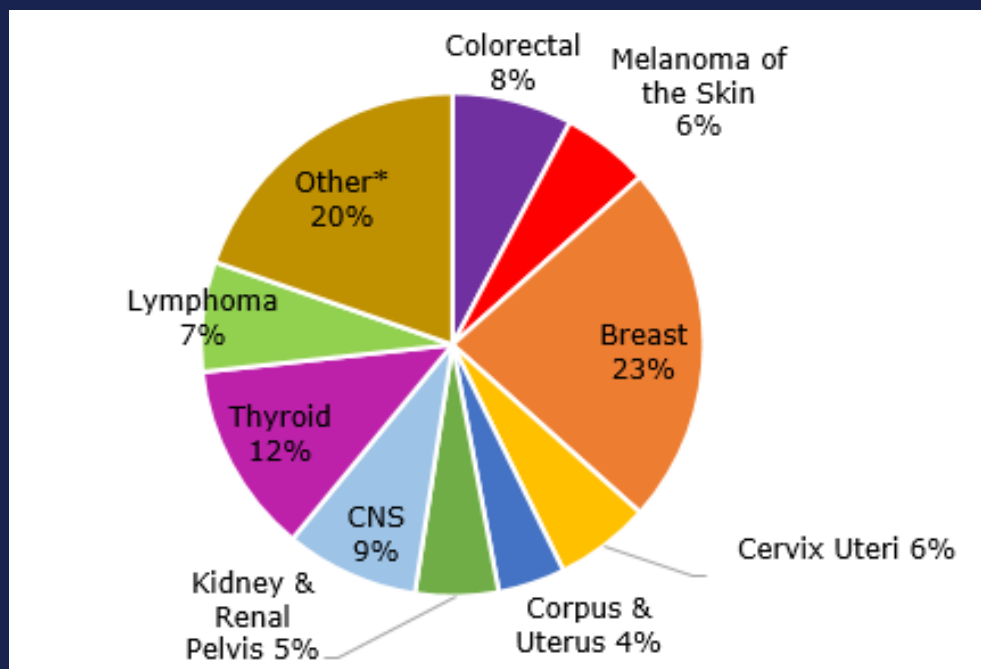


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# Incidence

## Common Cancer Sites (ages 30-39) by Primary Site, Texas 2010-2014



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# Incidence

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## Adolescent and Young Adult (AYA) Cancers

- Young women are more likely to be diagnosed with cancer than young men
- Incidence varies by race/ethnicity, as well as geographically

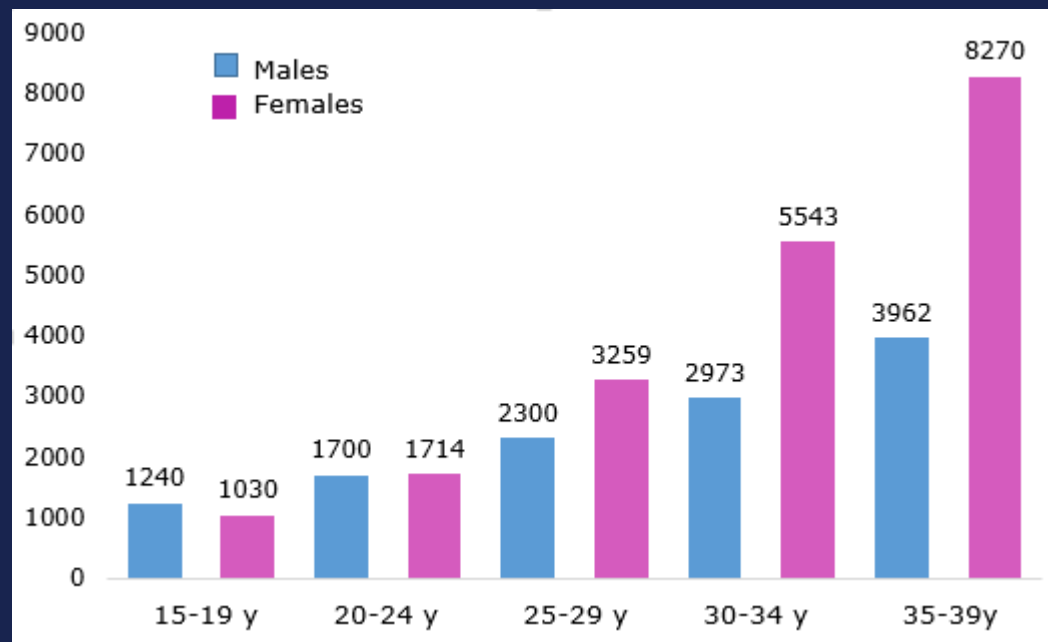


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# Incidence

## New Cancer Cases by Sex According to Adapted Classification of Tumors for AYA (ages 15-39), Texas 2010-2014



Source: Incidence - Texas, 1995-2014, cut-off 11-14-2016, SEER\*Prep 2.5.3 [19 Age Groups], Texas Cancer Registry, Texas Department of State Health Services, March 2017.

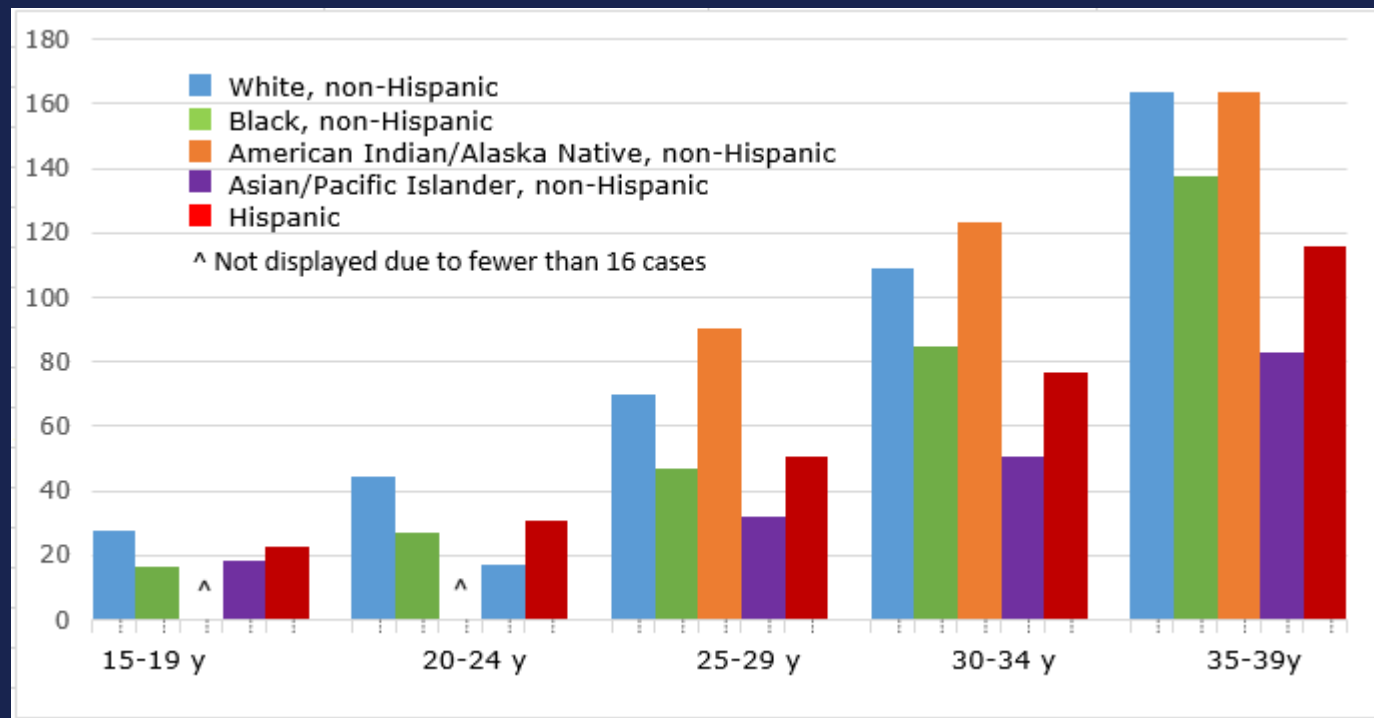


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# Incidence

## Age-Adjusted Cancer Incidence by Age and Race/Ethnicity, Texas 2010-2014



Rates are per 100,000 and age-adjusted to the 2000 US Std Population (a9 age groups – Census P25-1130) standard.  
 Source: Incidence of Texas and age-adjusted to the 2000 US Std Population (a9 age groups) – Texas Cancer Registry, Texas Department of State Health Services, March 2017.  
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# Incidence

## Age-Adjusted Cancer Incidence by Health Service Region, Texas 2010-2014

HSR	Age at Diagnosis				
	15-19	20-24	25-29	30-34	35-39
HSR 1	26.4	31.2	65.7	99.1	149.3
HSR 11	24.9	30.2	54.2	86.6	127.3
HSR 2/3	24.2	37.3	60.3	91.8	144.3
HSR 4/5N	25.2	31.2	50.8	90.8	132.6
HSR 6/5S	25.1	41.1	56.7	88.7	133
HSR 7	17.9	29.3	55.4	93.9	136.8
HSR 8	25.3	34.4	64.6	94.9	143
HSR 9/10	24.7	34.7	59.3	89.6	138



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Rates are per 100,000 and age-adjusted to the 2000 US Std Population (a9 age groups – Census P25-1130) standard.  
Source: Incidence - Texas, 1995-2014, cut-off 11-14-2016, SEER\*Prep 2.5.3 [19 Age Groups], Texas Cancer Registry, Texas Department of State Health Services, March 2017.



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# Mortality

- About **9,000** young people (ages 15-39) die from cancer each year in the **U.S.**
- Almost **1,100** young people (ages 15-39) die from cancer each year in **Texas**
  - Accounts for nearly **10 percent** of cancer deaths
  - Is the **leading** cause of death from disease among females and is **2<sup>nd</sup>** only to heart disease among males

<https://www.cancer.gov/types/aya>, accessed Feb. 20, 2017

Source: Mortality - Texas, 1990-2014, SEER\*Prep 2.5.3 [19 Age Groups], Texas Cancer Registry, Texas Department of State Health Services, March 2017.

# Mortality

## Age-Adjusted Cancer Mortality by Cancer Site, Texas 1995-2014

Cancer Site	Age at Death					
	All AYA	20-24	25-29	30-34	35-39	35-39
All Malignant Cancers	10.8	3.8	5.1	7.0	12.4	23.1
Colon and Rectum	0.8	0.1	0.2	0.5	1.0	2.1
Bones and Joints	0.3	0.6	0.4	0.3	0.2	0.2
Soft Tissue including Heart	0.5	0.4	0.4	0.4	0.5	0.6
Melanoma of the Skin	0.4	0.0	0.1	0.3	0.5	0.9
Breast	1.4	^	0.1	0.4	1.7	4.1
Cervix Uteri	0.6	^	0.1	0.4	0.9	1.6
Ovary	0.3	^	0.1	0.2	0.3	0.6
Testis	0.2	0.1	0.3	0.2	0.2	0.2
Kidney and Renal Pelvis	0.2	0.0	0.1	0.1	0.2	0.4
Brain and Other Nervous System	1.0	0.6	0.5	0.7	1.1	1.7
Thyroid	0.0	^	^	^	^	0.1
Lymphoma	1.0	0.4	0.6	0.9	1.3	1.6
Hodgkin Lymphoma	0.3	0.1	0.2	0.3	0.3	0.3
Non-Hodgkin Lymphoma	0.7	0.3	0.4	0.6	0.9	1.3
Leukemia	1.3	1.2	1.3	1.1	1.3	1.6



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Rates are per 100,000 and age-adjusted to the 2000 US Std Population (a9 age groups – Census P25-1130) standard.  
Source: Mortality - Texas, 1990-2014, SEER\*Prep 2.5.3 [19 Age Groups], Texas Cancer Registry, Texas Department of State Health Services, March 2017.



# Survival



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- Survival rates for cancer in young adults have not changed much in recent decades, unlike improvements seen in many cancers in children and young adults.
- Survival rates vary based on age, the type of cancer, and other factors

# Survival



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- For the U.S., the survival deficit is survival rates for cancer in young adults have not changed much in recent decades, unlike improvements seen in many cancers in children and young adults.
- Survival rates vary based on age, the type of cancer, and other factors

# Survival

## 5-Year Relative Survival Rates by Age at Diagnosis, Texas 1995-2014

Cancer Type	Age at Diagnosis				
	15-19	20-24	25-29	30-34	35-39
Total	81.3%	82.5%	83.2%	80.6%	77.5%
Leukemias	62.9%	56.3%	60.4%	61.3%	61.7%
Lymphomas	87.9%	86.4%	84.0%	79.3%	76.1%
CNS (malignant only)	79.0%	75.3%	75.1%	69.4%	64.8%
Osseous & Chondromatous Neoplasms	65.9%	64.1%	73.7%	66.6%	79.6%
Soft Tissue Sarcomas	68.9%	70.6%	66.1%	62.1%	63.7%
Germ Cell & Trophoblastic Neoplasms	93.2%	91.7%	94.8%	94.3%	93.8%
Melanoma & Skin Carcinomas	94.1%	93.4%	92.1%	91.4%	88.9%
Carcinomas	87.1%	84.1%	83.1%	80.8%	77.5%
Thyroid Carcinoma	99.1%	99.0%	99.8%	99.2%	99.1%
Breast Carcinoma	77.3%	69.8%	78.4%	80.7%	83.6%
Colorectal Carcinoma	69.3%	68.8%	66.8%	64.4%	66.6%
Miscellaneous Specified Neoplasms	84.4%	86.3%	89.6%	87.0%	80.6%
Unspecified Malignant Neoplasms	89.1%	86.5%	90.2%	86.6%	78.1%

Actuarial method. Ederer II method used for cumulative expected. Expected rates for Relative Survival are from U.S. 1970-2010 by individual year (White, Black, Other (AI/API), Ages 0-99, all races for other unspecified 1991+ and unknown) 95% CI. Source: Mortality - Texas, 1990-2014, SEER\*Prep 2.5.3 [19 Age Groups], Texas Cancer Registry, Texas Department of State Health Services, March 2017.



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# SEER(a) 5-Year Relative Survival (Percent) for the Top 5 Cancer Sites(b) by Age All Races, Both Sexes, 1975-2012

Ages 15-19						
Site	1975-2012	1975-1982	1983-1990	1991-1998	1999-2005	2006-2012
All Malignant Cancers	78.2	69	76.3	79.3	81.5	85.2
Hodgkin Lymphoma	92.3	88.3	88.9	94.2	95.9	97.1
Brain and ONS	73.3	62.2	73	78	76.2	77.1
Thyroid	99	99.2	98.9	98.8	98.6	99.2
Non-Hodgkin Lymphoma	72.4	51.4	69.4	72	80.1	83.7
Testis	90.2	77.2	91.8	90.1	94.5	94.4



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# SEER(a) 5-Year Relative Survival (Percent) for the Top 5 Cancer Sites(b) by Age All Races, Both Sexes, 1975-2012

<b>Ages 20-24</b>						
Site	1975-2012	1975-1982	1983-1990	1991-1998	1999-2005	2006-2012
All Malignant Cancers	80.9	74.7	78.4	81.1	84.7	86.2
Hodgkin Lymphoma	90.7	85	89.8	91	94.5	94.9
Testis	92.5	84.8	90.5	95	96.6	94.8
Thyroid	99.7	99.6	99.6	99.3	99.6	100
Melanoma of the Skin	92.8	85.8	90.5	94.5	96.7	96.8
Brain and ONS	66.9	59.1	60.8	71.2	66.9	78.3



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# SEER(a) 5-Year Relative Survival (Percent) for the Top 5 Cancer Sites(b) by Age All Races, Both Sexes, 1975-2012

<b>Ages 25-29</b>						
Site	1975-2012	1975-1982	1983-1990	1991-1998	1999-2005	2006-2012
All Malignant Cancers	79.7	76.7	74	77.3	84.8	87.2
Melanoma of the Skin	93.3	88.1	91.6	94	96.2	96.6
Thyroid	99.7	99.7	99.3	99.9	99.7	99.2
Testis	95.1	88.1	95.1	96.1	97.2	97.4
Hodgkin Lymphoma	90.5	85.3	89.1	92	91.9	95.5
Breast	74.4	69.4	68.3	73.1	82.9	83.9



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# SEER(a) 5-Year Relative Survival (Percent) for the Top 5 Cancer Sites(b) by Age All Races, Both Sexes, 1975-2012

<b>Ages 30-34</b>						
Site	1975-2012	1975-1982	1983-1990	1991-1998	1999-2005	2006-2012
All Malignant Cancers	76	73.5	68.4	71.8	83.1	86.3
Breast	77.4	70	72.8	77.5	83.6	86
Melanoma of the Skin	92.6	86.5	90.5	93.5	95.8	96.2
Thyroid	99.7	99.5	99.5	99.8	99.8	99.6
Testis	95.7	92	95.6	96	95.8	97.5
Cervix Uteri	84.6	84.3	83.1	85.1	87.6	82.9



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# SEER(a) 5-Year Relative Survival (Percent) for the Top 5 Cancer Sites(b) by Age All Races, Both Sexes, 1975-2012

<b>Ages 35-39</b>						
Site	1975-2012	1975-1982	1983-1990	1991-1998	1999-2005	2006-2012
All Malignant Cancers	74	68	65.8	71.5	80.6	83.7
Breast	81.5	74.9	76.1	82.7	86	87.5
Melanoma of the Skin	92.3	87.4	90	92.5	95.1	95.3
Thyroid	99.5	99	99.2	99.4	99.3	99.9
Non-Hodgkin Lymphoma	63.9	65.9	51.6	52.6	73.4	83.3
Colon and Rectum	63.3	54.8	56.6	61.6	69.9	68.7



# Texas Cancer Registry Next Steps



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- Continue to support AYA-related research and activities
- Provide annual AYA Texas statistics
  - Estimated new cases and deaths
  - Survival
  - Prevalence
- Evaluate when sufficient data will be available for trends
- Provide annual Fact Sheets
- AYA in Texas Special Report
- Add AYA to web query tool





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# Thank you

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